# TCM-82V/84V/85V/86V/89V

# SERVICE MANUAL

*US Model*

*Canadian Model*
*AEP Model*
*UK Model*

*E Model*

Photo : TCM-89V

| | | |
|---|---|---|
| Model Name Using Similar Mechanism | TCM-11, 15V, 21, 23V<br>TCM-31, 32V, 33, 34V<br>TCM-35, 37V, 71, 73 | |
| Tape Transport Mechanism Type | TCM-82V/86V | MT-82V-13 |
| | TCM-84V/85V/89V | MT-84V-13 |

## SPECIFICATIONS

Recording system — 2-track 1-channel monaural

Frequency response — 150 – 6,000Hz

Speaker — Approx. 4cm (1 5/8 inches) dia.

Power output — 130mW (at 10% harmonic distortion)

Input — Microphone input jack (minijack) sensitivity 0.2mV for 3kΩ or lower impedance microphone

Output — Earphone jack (minijack) for 8 – 300 Ω earphone

Power requirements — 3V DC, two size AA (R6) batteries
two NC-AA rechargeable batteries (1.2V) (supplied to TCM-89V)
DC IN 3V jack accepts :

- Sony AC power adaptor AC-D2M (not supplied), or the AC power adaptor supplied to TCM-85V: Canadian, AEP, UK/86V/89V for use on :

| | |
|---|---|
| US, Canadian model | 120V AC, 60Hz |
| UK model | 240V AC, 50Hz |
| AEP model | 220V AC, 50Hz |

- Sony DCC-70 car battery cord (not supplied) for use with 12V car battery

Battery life

| Battery | Recording hours |
|---|---|
| Sony battery SUM-3 (NS) | Approx. 4 |
| Sony alkaline battery AM3 (N) | Approx. 12 |
| NC-AA rechargeable battery (TCM-89V) | Approx. 4 |

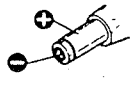
Dimensions — TCM-82V/86V :
Approx. 136.5×94.8×40.5mm(w/h/d)
(5 3/8×3 3/4×1 5/8 inches)
TCM-84V/85V/89V :
Approx. 137.2×94.8×40.5mm(w/h/d)
(5 1/2×3 3/4×1 5/8 inches)
incl. projecting parts and controls

Weight — TCM-82V/86V : Approx. 261g (9.2 oz)
TCM-84V : Approx. 262g (9.2 oz)
TCM-85V/89V :
Approx. 265g (9.3 oz) incl. batteries

Supplied accessories — Battery tube (1), AC power adaptor (1) (TCM-85V : Canadian, AEP, UK/86V/89V only), Battery charge adaptor (1) (TCM-89V only), Rechargeable battery (2) (TCM-89V only)

Design and specifications subject to change without notice.

**Note :** Use only the recommended AC power adaptor or car battery cord manufactured by Sony. Polarity of the plugs of other manufactures may be different.



Polarity of the Sony plug

MICROFILM

CASSETTE-CORDER

SONY®

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## SERVICE NOTE

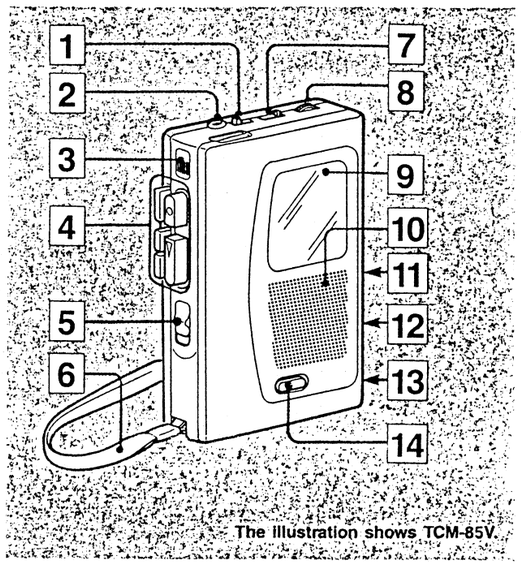
- **Repairing printed resistor**
  Cut both sides of the resistor and solder the carbon resistor having same value in place of printed one of the conductor side.
  1／32W carbon resistor is supplied for the replacing part of the printed resistor.

**Notes on chip component replacement**
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

# SECTION 1
# GENERAL

This section is extracted from instruction manual.

### PARTS IDENTIFICATION



The illustration shows TCM-85V.

1 **VOR (voice operated recording) ON/OFF switch**
2 **EAR (earphone) jack**
3 **Built-in microphone**
4 **Tape operation buttons**
● **REC** (record)/▼ **PLAY**/ ■ **STOP**/ ⏬ **FF/CUE** (fast forward/cue)/ ⏫ **REW/REVIEW** (rewind/review)
5 **PAUSE switch**
6 **Hand strap**
7 **TAPE COUNTER and reset button** (TCM-84V／85V／89V)
For indexing the tape contents. Before recording, push the reset button to set the counter to "000".
8 **VOLUME/VOR SENS (VOR sensitivity ) control**
In the playback mode: functions as volume control
In the recording mode: functions as VOR sensitivity control
9 **Cassette holder**
10 **Speaker** (front)
11 **MIC PLUG IN POWER (external microphone) input jack** (right side)
12 **DC IN 3 V (external power input) jack** (right side)
13 **Battery compartment** (right side)
14 **CUE MARKER button** (TCM-85V/89V)



# SECTION 2
# MECHANICAL ADJUSTMENTS

**PRECAUTION**

1. Clean the following parts with a denatured-alcohol-moistened swab:

| | |
|---|---|
| record/playback head | pinch roller |
| erase head | rubber belts |
| capstan | idlers |

2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

**power supply voltage: 3V dc**

**Torque Measurement**

| Torque | Meter Reading | Torque Meter |
|---|---|---|
| Forward | More than 25 g-cm (More than 0.34 oz-inch) | CQ-102C |
| Fast Forward and Rewind | More than 60 g-cm (More than 0.83 oz-inch) | CQ-201B |
| Back Tension | 1.5 – 4 g-cm (0.021 – 0.056 oz-inch) | CQ-102C |

**Tape Tension Measurement**

| Meter | Meter Reading |
|---|---|
| CQ-403A | More than 70 g (2.47 oz) |

# SECTION 3
# ELECTRICAL ADJUSTMENTS

**Test tape**

| Type | Signal | Used for |
|---|---|---|
| WS-48A | 3kHz, 0dB | tape speed adjustment |

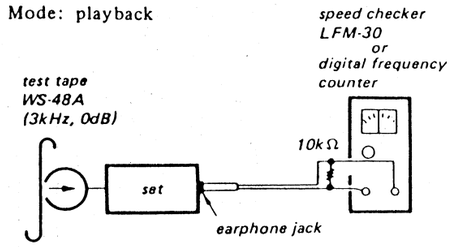
**Tape Speed Adjustment**

**Setting:**

VOL control: mechanical mid

**Procedure:**

Mode: playback

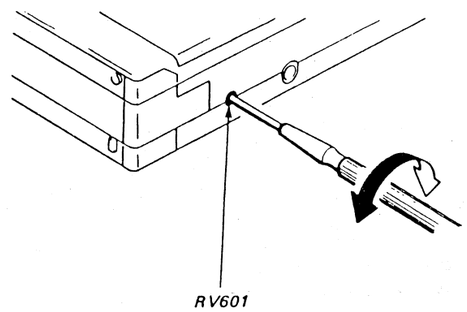



Specification:

| Speed checker | Digital frequency counter |
|---|---|
| −0.5 to +1.5% | 2,985 – 3,045 Hz |

Frequency difference between the beginning and the end of the tape should be within 1% (30Hz).

Adjustment Location:



# SECTION 4
# DIAGRAMS

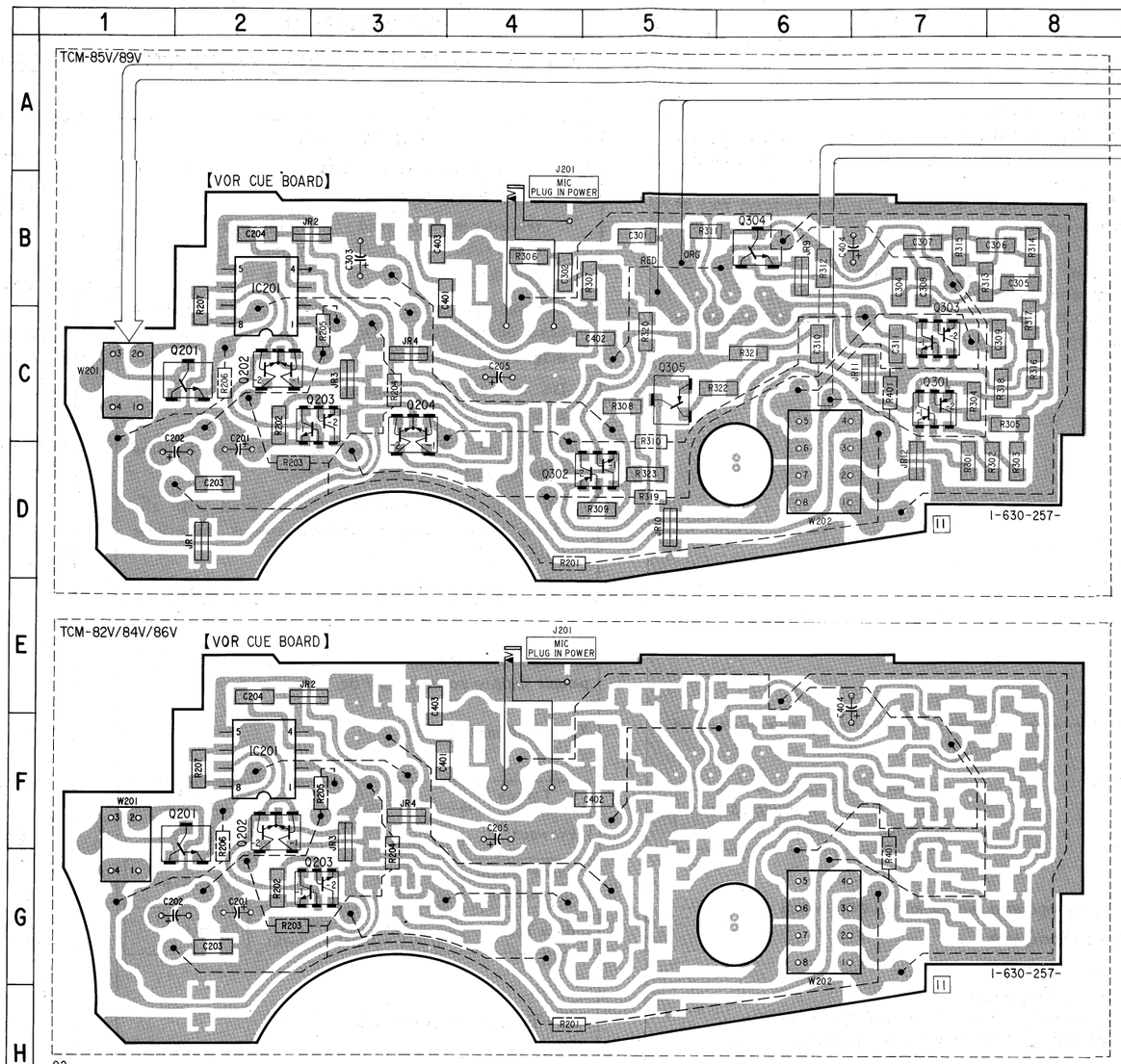
## • SEMICONDUCTOR LOCATION

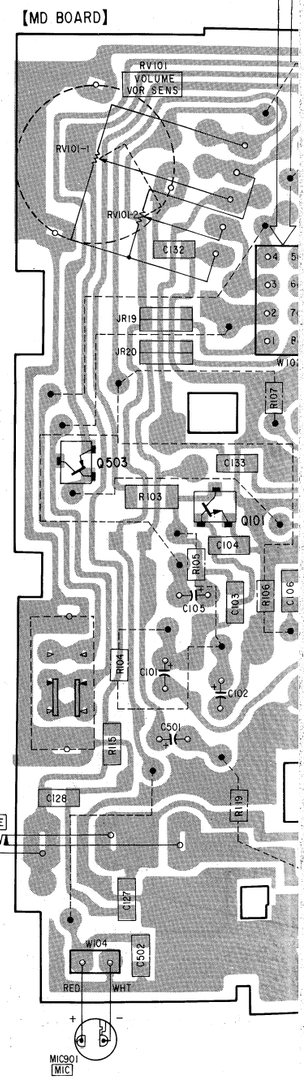
| Ref. No. | Location |
|---|---|
| TCM-85V／89V | |
| IC201 | B－2 |
| Q201 | C－2 |
| Q202 | C－2 |
| Q203 | C－3 |
| Q204 | C－3 |
| Q301 | C－7 |
| Q302 | D－4 |
| Q303 | C－7 |
| Q304 | B－6 |
| Q305 | C－5 |
| TCM-82V／84V／86V | |
| IC201 | F－2 |
| Q201 | F－2 |
| Q202 | F－2 |
| Q203 | G－3 |
| COMMON | |
| IC101 | E－15 |
| IC601 | G－20 |
| Q101 | G－11 |
| Q102 | E－12 |
| Q503 | G－10 |
| D101 | E－13 |
| D102 | E－13 |

Note :

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ■ : parts mounted on the conductor side.
- ● : Through hole.
- □ : Chip components extracted from the side which is seen.
- [ ] : Printed resistor.
- ▒ : Pattern on the side which is seen.
- ●----● : Pattern on the rear side.

## 4-1. PRINTED WIRING BOARD

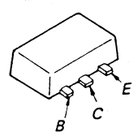


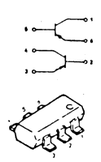

## • SEMICONDUCTOR LEAD LAYOUTS

LA5523

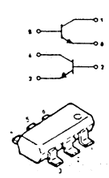
DTB113ZK



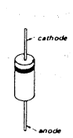

XN4401



XN4601

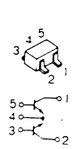


1T22A

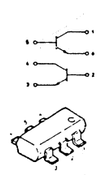



NJM2072M
NJM2073D

XN1214



XN4501



2SA1162
2SC1623
2SC2712G

TCM-85V/89V

【CUE SW BOARD】

ORG
RED
S301
CUE MARKER
I-639-645-
11

【MD BOARD】

J102
DC IN 3V

RV101
VOLUME
VOR SENS

W105
BLU
WHT

RV601
(TAPE SPEED)
TH601

Q102
D102
D101
Q503
Q101
IC101
W102
W104
RED
WHT
MIC901
MIC

S102
VOR
ON
OFF

S101
REC/PB
REC
PB

J101
EARPHONE

HRP901
REC/PB HEAD
WHT
(GRY)

S103
(POWER)

W101

SP901
SPEAKER
WHT
BLU

IC601

S601
PAUSE
OFF → ON

W106
BLK
WHT

W103
BLU
RED

DRY BATTERY
SIZE "AA"
(IEC DESIGNATION R6)
2PCS 3V

M901
MOTOR
BLK
WHT

I-630-002-
14

I-630-257-
11

I-630-257-
11

1T22A

cathode
anode

Note :

- All capacitors are in μ F unless otherwise noted. pF : μ μ F 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- : printed resistor.
- B+ : B+ Line
- : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack.
- no mark : PLAY
  ( ) : REC
  〈 〉 : VOR SW ON
- Voltages are taken with a VOM (Input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  : PB

MIC901 MIC

HRP901 REC/PB HEAD

HE901 ERASE HEAD

TCM-82V/ 84V/ 86V

【VOR CUE BOARD】

J201 MIC PLUG IN POWER

W202 W201

C402 0.1 R401 7.5k C404 47 4V C401 0.1 C403 0.001

B+

R206 4.7k R207 4.7k

IC201 NJM2072M VOR

C205 10 6.3V

Q201 2SC2712G PROTECTOR

R201 10k C202 3.3 25V R205 22k R203 12k

Q202

C201 10 6.3V C203 4700p C204 0.001 R204 270k

Q203-2 Q203-1 R202 10k

Q203 XN4501 MUTING / PROTECTOR

Q202 XN1214 VOR STOP

TCM-85V/89V

【VOR CUE BOARD】

J201 MIC PLUG IN POWER

【CUE SW BOARD】

S301 CUE MARKER

C402 0.1 R401 7.5k C401 0.1 C403 0.001

B+

Q301-1 R321 1M R304 2.2k R301 10k

Q305 2SA1162 R322 1k R323 100

Q301-2 R302 15k R305 4.7k C310 1 R303 1.5k

Q301 XN4401 RIPPLE FILTER

C301 0.001 R308 470k

Q302-2 Q302-1 R309 33k R320 10k C302 1 R306 10k R307 1M

R311 12k R310 2.2k C311 1

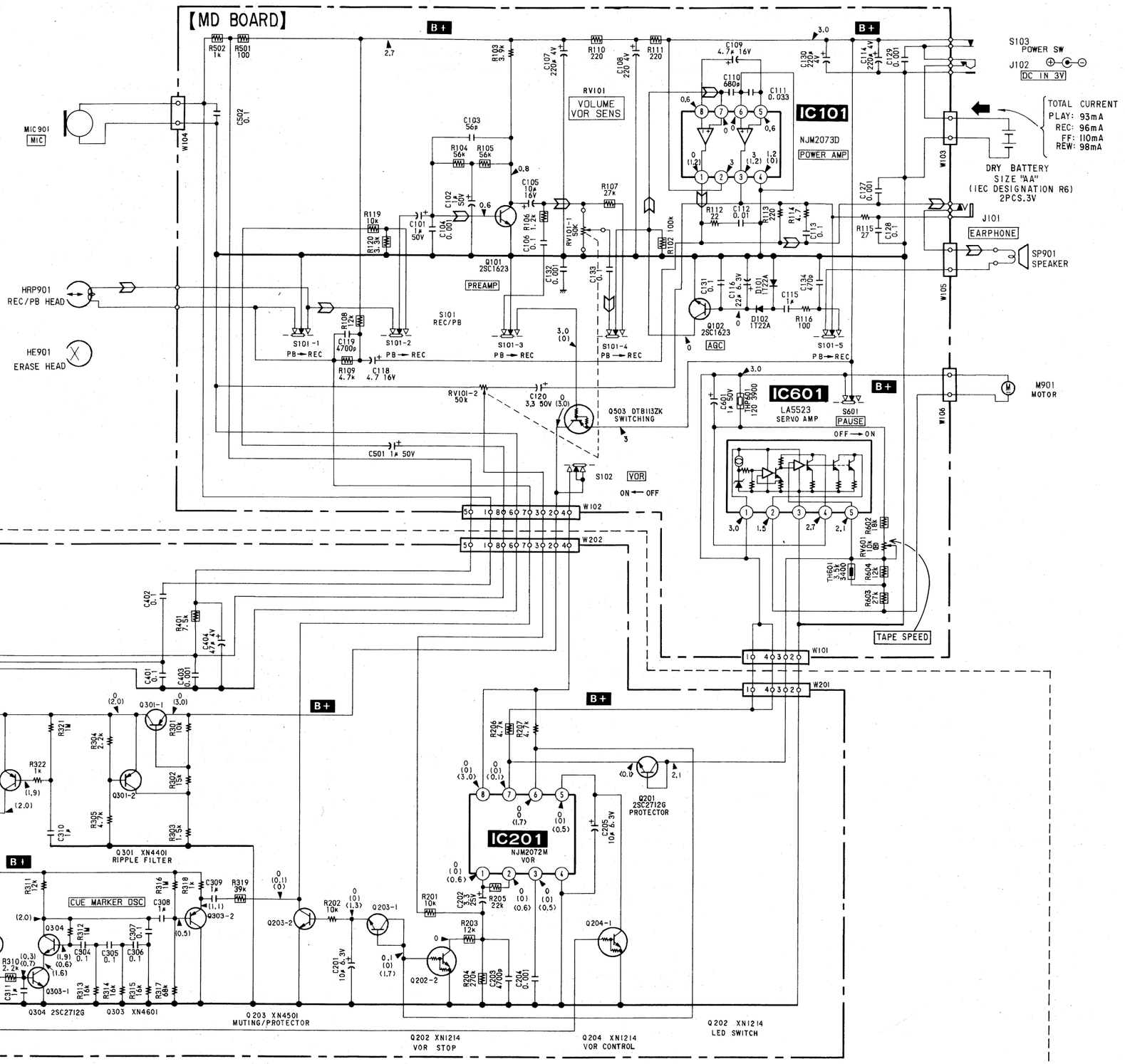
CUE MARKER OSC

Q304 R312 1M C304 0.1 C305 0.1 C307 0.1 C306 0.1 C308 1 R316 R318 1k

Q303-1 C303 47 4V R313 16k R314 16k R315 16k R317 R319

Q304 2SC2712G Q303 XN4601

Q302 XN4601 TIMER


【MD BOARD】
B+
IC101
NJM2073D
POWER AMP
RV101
VOLUME
VOR SENS
MIC901
MIC
HRP901
REC/PB HEAD
HE901
ERASE HEAD
Q101
2SC1623
PREAMP
Q102
2SC1623
AGC
S101
REC/PB
S101-1 PB→REC
S101-2 PB→REC
S101-3 PB→REC
S101-4 PB→REC
S101-5 PB→REC
IC601
LA5523
SERVO AMP
S601
PAUSE
OFF→ON
M901
MOTOR
TAPE SPEED
S102
VOR
ON←OFF
Q503 DTB113ZK
SWITCHING
S103
POWER SW
J102
DC IN 3V
TOTAL CURRENT
PLAY: 93mA
REC: 96mA
FF: 110mA
REW: 98mA
DRY BATTERY
SIZE "AA"
(IEC DESIGNATION R6)
2PCS.3V
J101
EARPHONE
SP901
SPEAKER
【VOR CUE BOARD】
J201
MIC
IN POWER
IC201
NJM2072M
VOR
Q201
2SC2712G
PROTECTOR
Q301 XN4401
RIPPLE FILTER
CUE MARKER OSC
Q302 XN4601
TIMER
Q304 2SC2712G
Q303 XN4601
Q203 XN4501
MUTING/PROTECTOR
Q202 XN1214
VOR STOP
Q204 XN1214
VOR CONTROL
Q202 XN1214
LED SWITCH
W101
W102
W103
W104
W105
W106
W201
W202

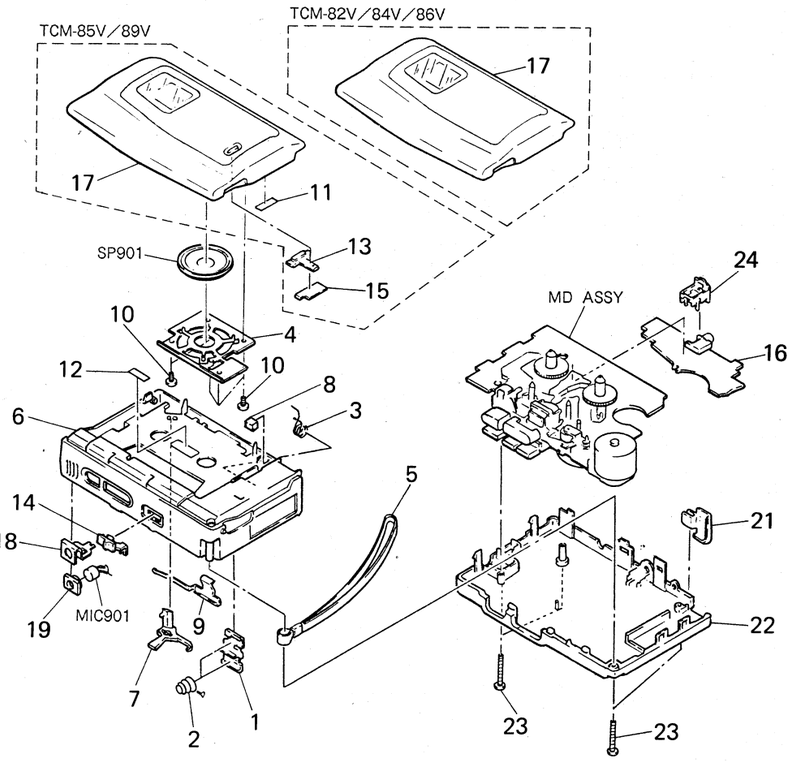
# SECTION 5
# EXPLODED VIEWS

**NOTE:**

- −XX, −X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE)....(RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

(82V) : TCM-82V (86V) : TCM-86V
(84V) : TCM-84V (89V) : TCM-89V
(85V) : TCM-85V

## 5-1. CABINET

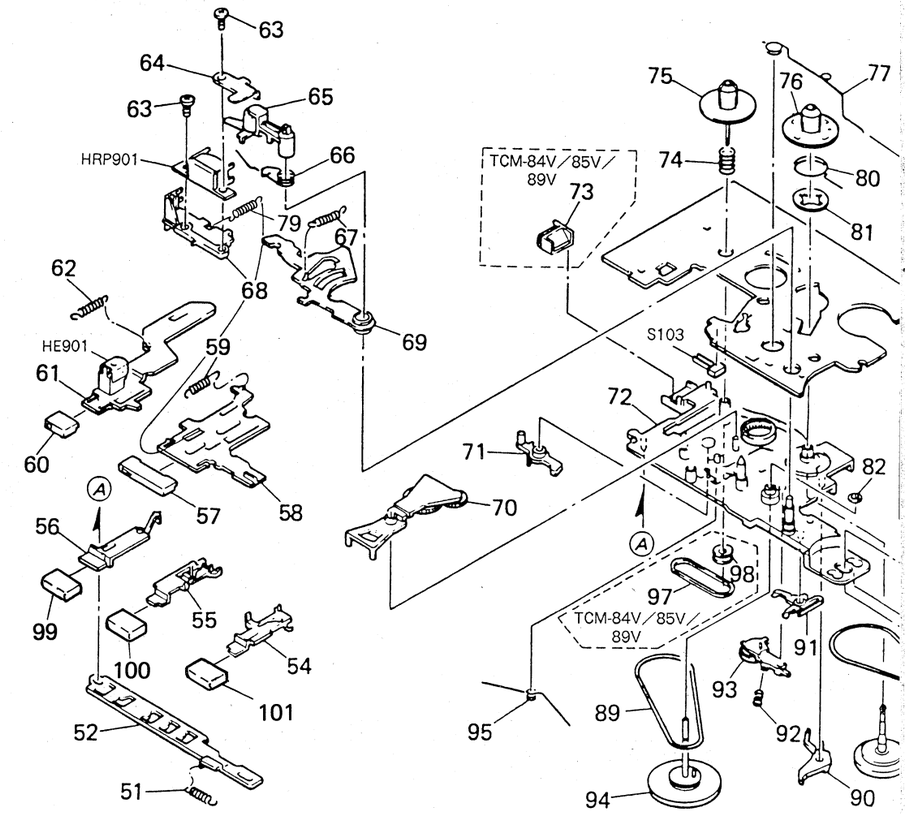



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | 3-352-440-01 | HOLDER (BATTERY TERMINAL) | |
| 2 | 3-352-439-01 | SPRING | |
| 3 | 3-352-433-01 | SPRING | |
| 4 | * 3-367-091-01 | RETAINER, SP | |
| 5 | 3-320-982-01 | STRAP, HAND | |
| 6 | 3-367-100-11 | CABINET (FRONT) (82V:US) | |
| 6 | 3-367-100-31 | CABINET (FRONT) (84V/85V) | |
| 6 | 3-367-100-41 | CABINET (FRONT) (89V) | |
| 6 | 3-367-100-51 | CABINET (FRONT) (86V) | |
| 6 | 3-367-100-71 | CABINET (FRONT) (82V:E/EA) | |
| 7 | 3-320-976-01 | CLAW, ERASE SAFETY | |
| 8 | 9-911-841-XX | CUSHION (B) | |
| 9 | 3-320-977-01 | SPRING | |
| 10 | 3-318-382-21 | SCREW (1.7X3), TAPPING | |
| 11 | 3-831-441-XX | CUSHION, CABINET UPPER 10X7X0.3 (85V/89V) | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 12 | 3-578-101-11 | PLATE, ORNAMENTAL | |
| 13 | 3-367-098-01 | BUTTON, CUE (85V/89V) | |
| 14 | 3-367-092-01 | BUTTON, PAUSE | |
| 15 | * 1-639-645-11 | CUE SW BOARD (85V/89V) | |
| 16 | * A-3015-757-A | VOR BOARD, COMPLETE (82V/84V/86V) | |
| 16 | * A-3016-095-A | VOR CUE BOARD, COMPLETE (85V/89V) | |
| 17 | X-3363-091-1 | LID ASSY, CASSETTE (89V) | |
| 17 | X-3363-093-1 | LID ASSY, CASSETTE (86V) | |
| 17 | X-3363-094-1 | LID ASSY, CASSETTE (85V) | |
| 17 | X-3363-095-1 | LID ASSY, CASSETTE (84V) | |
| 17 | X-3363-097-1 | LID ASSY, CASSETTE (82V) | |
| 18 | * 3-352-434-01 | HOLDER (A), MIC | |
| 19 | 3-320-975-01 | CUSHION (A), MICROPHONE | |
| 21 | X-3363-099-1 | LID ASSY, BATTERY CASE | |
| 22 | 3-367-102-01 | CABINET (REAR) | |
| 23 | 3-335-640-51 | SCREW (M2X16) | |
| 24 | 3-352-456-01 | HOLDER, JACK | |
| MIC901 | 1-542-080-11 | MICROPHONE, BUILT-IN | |
| SP901 | 1-544-497-11 | SPEAKER | |



## 5-2. MD MT-82V-13 : TCM-82V／86V
## MT-84V-13 : TCM-84V／85V／89V

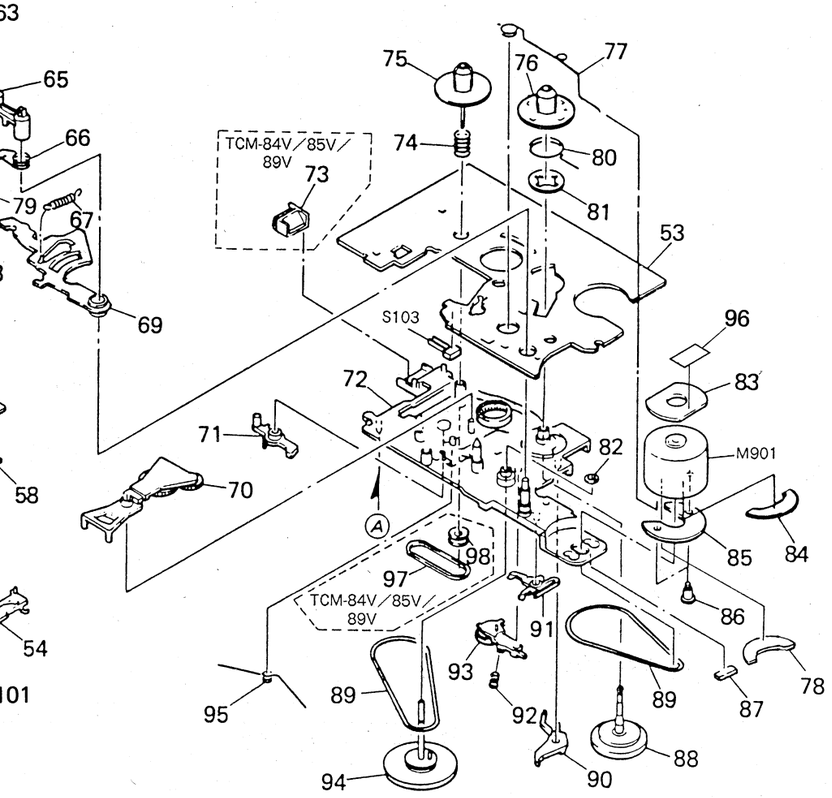



| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 51 | 3-342-031-01 | SPRING, TENSION | |
| 52 | * 3-342-040-01 | PLATE, LOCK | |
| 53 | * A-3089-459-A | MD BOARD, COMPLETE | |
| 54 | 3-320-993-01 | LEVER, FF | |
| 55 | 3-320-992-01 | LEVER, REW | |
| 56 | 3-320-994-01 | LEVER, STOP | |
| 57 | 3-367-095-01 | BUTTON, PLAY | |
| 58 | 3-352-449-01 | LEVER, PLAY | |
| 59 | 3-342-029-01 | SPRING, TENSION (POWER TENSION) | |
| 60 | 3-367-097-01 | BUTTON, REC | |
| 61 | 3-320-995-01 | LEVER, REC | |
| 62 | 3-342-032-01 | SPRING, TENSION | |
| 63 | 3-352-473-01 | SCREW (2), TAPPING | |
| 64 | * 3-370-052-01 | RETAINER, LEVER | |
| 65 | X-3320-921-1 | PINCH ROLLER ASSY | |
| 66 | 3-352-470-01 | SPRING (P), TORSION | |
| 67 | 3-342-033-01 | SPRING, TENSION | |
| 68 | * 3-352-447-01 | BASE (A), HEAD | |
| 69 | 3-352-448-01 | BASE (B), HEAD | |
| 70 | X-3320-920-1 | ARM ASSY, FR | |
| 71 | 3-342-010-01 | ARM, CR | |
| 72 | X-3352-402-1 | CHASSIS ASSY, MECHANICAL | |
| 73 | 1-548-582-11 | COUNTER, TAPE (SMALL TYPE) (84V/85V/89V) | |
| 74 | 3-342-030-01 | SPRING, COMPRESSION | |
| 75 | 3-342-013-01 | GEAR, S REEL | |
| 76 | 3-342-014-01 | GEAR, T REEL | |
| 77 | 3-352-453-11 | SPRING (GROUND) | |
| 78 | 3-352-476-01 | SHEET (MOTOR) | |

| Ref. No. | Part No. | Description |
|---|---|---|
| 79 | 3-352-451-01 | SPRING, TENSION (PC |
| 80 | 3-342-024-01 | SPRING |
| 81 | 3-342-055-01 | WASHER, T REEL |
| 82 | 3-321-483-11 | RING, RETAINING |
| 83 | 3-342-050-11 | RUBBER (A), VIBRAT |
| 84 | 3-342-075-01 | SPACER, MOTOR |
| 85 | 3-318-254-11 | CUSHION, MOTOR |
| 86 | 3-342-076-01 | SCREW (M2), PRECIS |
| 87 | 9-911-839-XX | CUSHION (A) |
| 88 | X-3320-918-1 | PLATE ASSY, REEL, |
| 89 | 3-480-136-00 | BELT |
| 90 | 3-342-011-01 | LEVER (A), SHUT-OF |
| 91 | 3-342-012-01 | LEVER (B), SHUT-OF |
| 92 | 3-342-034-01 | SPRING, COMPRESSIO |
| 93 | X-3320-919-1 | ARM ASSY, IDLER |
| 94 | X-3320-916-1 | FLYWHEEL (PA) ASSY |
| 95 | 3-342-035-01 | SPRING (FR) |
| 96 | 3-831-441-11 | CUSHION (B) |
| 97 | 3-554-103-00 | BELT, DRIVING (84V |
| 98 | 3-320-999-11 | PULLEY (COUNTER) (8 |
| 99 | 3-367-096-01 | BUTTON, STOP |
| 100 | 3-367-094-01 | BUTTON, REW |
| 101 | 3-367-093-01 | BUTTON, FF |
| HE901 | 8-825-771-21 | HEAD, ERASE EBF5-3 |
| HRP901 | 1-543-607-21 | HEAD, MAGNETIC (RE |
| M901 | X-3320-925-1 | MOTOR ASSY |
| S103 | 1-570-549-21 | SWITCH, LEAF |

82V／86V
84V／85V／89V

63




| ion | Remark |
|---|---|
| TENSION | |
| OCK | |
| , COMPLETE | |
| F | |
| EW | |
| TOP | |
| PLAY | |
| LAY | |
| TENSION (POWER TENSION) | |
| REC | |
| EC | |
| TENSION | |
| ), TAPPING | |
| , LEVER | |
| LLER ASSY | |
| P), TORSION | |
| TENSION | |
| , HEAD | |
| , HEAD | |
| , FR | |
| ASSY, MECHANICAL | |
| TAPE (SMALL TYPE) (84V/85V/89V) | |
| COMPRESSION | |
| REEL | |
| REEL | |
| GROUND) | |
| OTOR) | |

| Ref. No. | Part No. | Description | Remark |
|---|---|---|---|
| 79 | 3-352-451-01 | SPRING, TENSION (POWER TENSION) | |
| 80 | 3-342-024-01 | SPRING | |
| 81 | 3-342-055-01 | WASHER, T REEL | |
| 82 | 3-321-483-11 | RING, RETAINING | |
| 83 | 3-342-050-11 | RUBBER (A), VIBRATION PROOF | |
| 84 | 3-342-075-01 | SPACER, MOTOR | |
| 85 | 3-318-254-11 | CUSHION, MOTOR | |
| 86 | 3-342-076-01 | SCREW (M2), PRECISION STEP | |
| 87 | 9-911-839-XX | CUSHION (A) | |
| 88 | X-3320-918-1 | PLATE ASSY, REEL, TAKE-UP | |
| 89 | 3-480-136-00 | BELT | |
| 90 | 3-342-011-01 | LEVER (A), SHUT-OFF | |
| 91 | 3-342-012-01 | LEVER (B), SHUT-OFF | |
| 92 | 3-342-034-01 | SPRING, COMPRESSION | |
| 93 | X-3320-919-1 | ARM ASSY, IDLER | |
| 94 | X-3320-916-1 | FLYWHEEL (PA) ASSY | |
| 95 | 3-342-035-01 | SPRING (FR) | |
| 96 | 3-831-441-11 | CUSHION (B) | |
| 97 | 3-554-103-00 | BELT, DRIVING (84V/85V/89V) | |
| 98 | 3-320-999-11 | PULLEY (COUNTER) (84V/85V/89V) | |
| 99 | 3-367-096-01 | BUTTON, STOP | |
| 100 | 3-367-094-01 | BUTTON, REW | |
| 101 | 3-367-093-01 | BUTTON, FF | |
| HE901 | 8-825-771-21 | HEAD, ERASE EBF5-36C | |
| HRP901 | 1-543-607-21 | HEAD, MAGNETIC (REC/PB) | |
| M901 | X-3320-925-1 | MOTOR ASSY | |
| S103 | 1-570-549-21 | SWITCH, LEAF | |



CUE SW MD

# SECTION 6
# ELECTRICAL PARTS LIST

**NOTE:**

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- −XX, −X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- Items marked "＊" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example :
  uA.... : μA...., uPA.... : μPA....
  uPB.... : μPB...., uPC.... : μPC....
  uPD.... : μPD....
- CAPACITORS
  uF : μF
- COILS
  uH : μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

(82V) : TCM-82V (86V) : TCM-86V
(84V) : TCM-84V (89V) : TCM-89V
(85V) : TCM-85V

| Ref. No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| | ＊ 1-639-645-11 | CUE SW BOARD (85V/89V) | | | |
| | | ********** | | | |
| | | < SWITCH > | | | |
| S301 | 1-571-887-21 | SWITCH, KEY BOARD (CUE MARKER) (85V/89V) | | | |
| | | ********** | | | |
| | ＊ A-3089-459-A | MD BOARD, COMPLETE | | | |
| | | ********** | | | |
| | | < CAPACITOR > | | | |
| C101 | 1-126-160-11 | ELECT | 1uF | 20% 50V | |
| C102 | 1-126-160-11 | ELECT | 1uF | 20% 50V | |
| C103 | 1-163-111-00 | CERAMIC CHIP | 56PF | 5% 50V | |
| C104 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% 50V | |
| C105 | 1-126-157-11 | ELECT | 10uF | 20% 16V | |
| C106 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V | |
| C107 | 1-124-434-00 | ELECT | 220uF | 20% 4V | |
| C108 | 1-124-434-00 | ELECT | 220uF | 20% 4V | |
| C109 | 1-126-163-11 | ELECT | 4.7uF | 20% 50V | |
| C110 | 1-163-007-11 | CERAMIC CHIP | 680PF | 10% 50V | |
| C111 | 1-163-034-00 | CERAMIC CHIP | 0.033uF | 50V | |
| C112 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | 50V | |
| C113 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V | |
| C114 | 1-124-434-00 | ELECT | 220uF | 20% 4V | |
| C115 | 1-162-611-00 | CERAMIC CHIP | 1uF | 25V | |
| C116 | 1-126-153-11 | ELECT | 22uF | 20% 6.3V | |
| C118 | 1-126-163-11 | ELECT | 4.7uF | 20% 50V | |
| C119 | 1-163-017-00 | CERAMIC CHIP | 0.0047uF | 5% 50V | |
| C120 | 1-126-162-11 | ELECT | 3.3uF | 20% 50V | |
| C127 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% 50V | |
| C128 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V | |
| C129 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% 50V | |
| C130 | 1-124-434-00 | ELECT | 220uF | 20% 4V | |
| C131 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V | |
| C132 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% 50V | |
| C133 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V | |
| C134 | 1-163-005-11 | CERAMIC CHIP | 470PF | 10% 50V | |
| C501 | 1-126-301-11 | ELECT | 1uF | 20% 50V | |
| C502 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V | |
| C601 | 1-126-301-11 | ELECT | 1uF | 20% 50V | |
| | | < DIODE > | | | |
| D101 | 8-719-022-21 | DIODE 1T22A | | | |
| D102 | 8-719-022-21 | DIODE 1T22A | | | |
| | | < IC > | | | |
| IC101 | 8-759-701-54 | IC NJM2073D | | | |
| IC601 | 8-759-801-12 | IC LA5523 | | | |
| | | < JACK > | | | |
| J101 | 1-566-740-11 | JACK (EARPHONE) | | | |
| J102 | 1-568-228-11 | JACK, EXTERNAL POWER (DC IN 3V) | | | |
| | | < JUMPER > | | | |
| JR1 | 1-216-296-00 | METAL CHIP | 0 | 5% 1/8W | |
| JR2 | 1-216-296-00 | METAL CHIP | 0 | 5% 1/8W | |
| JR3 | 1-216-296-00 | METAL CHIP | 0 | 5% 1/8W | |
| JR4 | 1-216-296-00 | METAL CHIP | 0 | 5% 1/8W | |
| JR5 | 1-216-296-00 | METAL CHIP | 0 | 5% 1/8W | |
| JR6 | 1-216-295-00 | METAL CHIP | 0 | 5% 1/10W | |
| JR7 | 1-216-295-00 | METAL CHIP | 0 | 5% 1/10W | |
| JR8 | 1-216-295-00 | METAL CHIP | 0 | 5% 1/10W | |
| JR9 | 1-216-295-00 | METAL CHIP | 0 | 5% 1/10W | |
| JR10 | 1-216-295-00 | METAL CHIP | 0 | 5% 1/10W | |

| Ref. No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| JR11 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |
| JR13 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR14 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR15 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR17 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR18 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR19 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR20 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| | | < TRANSISTOR > | | | |
| Q101 | 8-729-100-66 | TRANSISTOR 2SC1623-L6 | | | |
| Q102 | 8-729-100-66 | TRANSISTOR 2SC1623-L6 | | | |
| Q503 | 8-729-904-60 | TRANSISTOR DTB113ZK | | | |
| | | < RESISTOR > | | | |
| R102 | 1-249-441-11 | CARBON | 100K | 5% | 1/4W |
| R103 | 1-216-212-00 | METAL CHIP | 3.9K | 5% | 1/8W |
| R104 | 1-249-438-11 | CARBON | 56K | 5% | 1/4W |
| R105 | 1-249-438-11 | CARBON | 56K | 5% | 1/4W |
| R106 | 1-249-418-11 | CARBON | 1.2K | 5% | 1/4W |
| R107 | 1-249-434-11 | CARBON | 27K | 5% | 1/4W |
| R108 | 1-249-430-11 | CARBON | 12K | 5% | 1/4W |
| R109 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W |
| R110 | 1-249-409-11 | CARBON | 220 | 5% | 1/4W |
| R111 | 1-249-409-11 | CARBON | 220 | 5% | 1/4W |
| R112 | 1-216-009-00 | METAL CHIP | 22 | 5% | 1/10W |
| R113 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R114 | 1-216-308-00 | METAL CHIP | 4.7 | 5% | 1/10W |
| R115 | 1-216-011-00 | METAL CHIP | 27 | 5% | 1/10W |
| R116 | 1-216-025-00 | METAL CHIP | 100 | 5% | 1/10W |
| R119 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W |
| R120 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W |
| R501 | 1-249-405-11 | CARBON | 100 | 5% | 1/4W |
| R502 | 1-249-417-11 | CARBON | 1K | 5% | 1/4W |
| R602 | 1-249-432-11 | CARBON | 18K | 5% | 1/4W |
| R603 | 1-249-434-11 | CARBON | 27K | 5% | 1/4W |
| R604 | 1-249-430-11 | CARBON | 12K | 5% | 1/4W |
| | | < VARIABLE RESISTOR > | | | |
| RV101 | 1-237-772-11 | RES, VAR, CARBON 50K/50K (VOLUME/VOR SENS) | | | |
| RV601 | 1-237-278-11 | RES, ADJ, CARBON 10K (TAPE SPEED) | | | |
| | | < SWITCH > | | | |
| S101 | 1-571-151-11 | SWITCH, SLIDE (REC/PB) | | | |
| S102 | 1-571-478-11 | SWITCH, SLIDE (VOR) | | | |
| S103 | 1-570-549-21 | SWITCH, LEAF (POWER) | | | |
| S601 | 1-570-675-11 | SWITCH, SLIDE (PAUSE) | | | |

| Ref. No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| | | < THERMISTOR > | | | |
| TH601 | 1-808-980-11 | THERMISTOR | | | |
| THP601 | 1-808-272-11 | THERMISTOR, POSITIVE (120) | | | |
| | | < CONNECTOR > | | | |
| W101 | * 1-568-289-11 | PIN, CONNECTOR (PC BOARD) 4P | | | |
| W102 | * 1-566-669-11 | PIN, CONNECTOR (PC BOARD) 8P | | | |
| W103 | * 1-506-984-11 | PIN, CONNECTOR (PC BOARD) 2P | | | |
| W104 | * 1-506-984-11 | PIN, CONNECTOR (PC BOARD) 2P | | | |
| W105 | * 1-506-984-11 | PIN, CONNECTOR (PC BOARD) 2P | | | |
| W106 | * 1-506-984-11 | PIN, CONNECTOR (PC BOARD) 2P | | | |
| ********** | | | | | |
| | * A-3015-757-A | VOR BOARD, COMPLETE (82V/84V/86V) | | | |
| | * A-3016-095-A | VOR CUE BOARD, COMPLETE (85V/89V) | | | |
| | | ********** | | | |
| | * 3-352-456-01 | HOLDER, JACK | | | |
| | | < CAPACITOR > | | | |
| C201 | 1-126-157-11 | ELECT | 10uF | 20% | 16V |
| C202 | 1-126-162-11 | ELECT | 3.3uF | 20% | 50V |
| C203 | 1-163-017-00 | CERAMIC CHIP | 0.0047uF | 5% | 50V |
| C204 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% | 50V |
| C205 | 1-126-157-11 | ELECT | 10uF | 20% | 16V |
| C301 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% | 50V (85V/89V) |
| C302 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V (85V/89V) |
| C303 | 1-126-154-11 | ELECT | 47uF | 20% | 6.3V (85V/89V) |
| C304 | 1-164-004-11 | CERAMIC CHIP | 0.1uF | 10% | 25V (85V/89V) |
| C305 | 1-164-004-11 | CERAMIC CHIP | 0.1uF | 10% | 25V (85V/89V) |
| C306 | 1-164-004-11 | CERAMIC CHIP | 0.1uF | 10% | 25V (85V/89V) |
| C307 | 1-164-004-11 | CERAMIC CHIP | 0.1uF | 10% | 25V (85V/89V) |
| C308 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V (85V/89V) |
| C309 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V (85V/89V) |
| C310 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V (85V/89V) |
| C311 | 1-164-346-11 | CERAMIC CHIP | 1uF | | 16V (85V/89V) |
| C401 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C402 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C403 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% | 50V |
| C404 | 1-126-154-11 | ELECT | 47uF | 20% | 6.3V |
| | | < IC > | | | |
| IC201 | 8-759-701-51 | IC NJM2072M | | | |
| | | < JACK > | | | |
| J201 | 1-563-319-21 | JACK (MIC/PLUG IN POWER) | | | |

## VOR CUE

| Ref. No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| | | < JUMPER > | | | |
| JR1 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W(85V/89V) |
| JR2 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |
| JR3 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |
| JR4 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |
| JR9 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W(85V/89V) |
| JR10 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W (85V/89V) |
| JR11 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W(85V/89V) |
| JR12 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W(85V/89V) |
| | | < TRANSISTOR > | | | |
| Q201 | 8-729-271-22 | TRANSISTOR 2SC2712G | | | |
| Q202 | 8-729-420-16 | TRANSISTOR XN1214 | | | |
| Q203 | 8-729-402-81 | TRANSISTOR XN4501 | | | |
| Q204 | 8-729-420-16 | TRANSISTOR XN1214 (85V/89V) | | | |
| Q301 | 8-729-403-27 | TRANSISTOR XN4401 (85V/89V) | | | |
| Q302 | 8-729-402-84 | TRANSISTOR XN4601 (85V/89V) | | | |
| Q303 | 8-729-402-84 | TRANSISTOR XN4601 (85V/89V) | | | |
| Q304 | 8-729-271-22 | TRANSISTOR 2SC2712G (85V/89V) | | | |
| Q305 | 8-729-216-22 | TRANSISTOR 2SA1162-G (85V/89V) | | | |
| | | < RESISTOR > | | | |
| R201 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W |
| R202 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R203 | 1-249-430-11 | CARBON | 12K | 5% | 1/4W |
| R204 | 1-215-479-00 | METAL | 270K | 1% | 1/6W |
| R205 | 1-249-433-11 | CARBON | 22K | 5% | 1/4W |
| R206 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W |
| R207 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R301 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W(85V/89V) |
| R302 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W(85V/89V) |
| R303 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W(85V/89V) |
| R304 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W(85V/89V) |
| R305 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W(85V/89V) |
| R306 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W(85V/89V) |
| R307 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W(85V/89V) |
| R308 | 1-216-113-00 | METAL CHIP | 470K | 5% | 1/10W(85V/89V) |
| R309 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W(85V/89V) |
| R310 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W (85V/89V) |
| R311 | 1-216-075-00 | METAL CHIP | 12K | 5% | 1/10W(85V/89V) |
| R312 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W(85V/89V) |
| R313 | 1-216-078-00 | METAL GLAZE | 16K | 5% | 1/10W(85V/89V) |
| R314 | 1-216-078-00 | METAL GLAZE | 16K | 5% | 1/10W(85V/89V) |
| R315 | 1-216-078-00 | METAL GLAZE | 16K | 5% | 1/10W |
| R316 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W(85V/89V) |
| R317 | 1-216-093-00 | METAL CHIP | 68K | 5% | 1/10W(85V/89V) |
| R318 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W(85V/89V) |
| R319 | 1-249-436-11 | CARBON | 39K | 5% | 1/4W (85V/89V) |
| R320 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W(85V/89V) |
| R321 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W(85V/89V) |
| R322 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W(85V/89V) |
| R323 | 1-216-025-00 | METAL CHIP | 100 | 5% | 1/10W(85V/89V) |
| R401 | 1-215-442-00 | METAL | 7.5K | 1% | 1/6W |
| | | < SOCKET > | | | |
| W201 | * 1-563-317-31 | SOCKET, CONNECTOR (PC BOARD) 4P | | | |
| W202 | * 1-563-318-31 | SOCKET, CONNECTOR (PC BOARD) 8P | | | |

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MISCELLANEOUS

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| | | |
|---|---|---|
| 73 | 1-548-582-11 | COUNTER, TAPE (SMALL TYPE) (84V/85V/89V) |
| CNJ106 | * 1-563-470-11 | HOUSING, CONNECTOR (2P) |
| HE901 | 8-825-771-21 | HEAD, ERASE EBF5-36C |
| HRP901 | 1-543-607-21 | HEAD, MAGNETIC (REC/PB) |
| M901 | X-3320-925-1 | MOTOR ASSY |
| MIC901 | 1-542-080-11 | MICROPHONE, BUILT-IN |
| SP901 | 1-544-497-11 | SPEAKER |

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ACCESSORY & PACKING MATERIAL EA:Saudi Arabia

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⚠ 1-465-531-11 ADAPTOR, AC (85V:Canadian/86V/89V)
⚠ 1-465-722-11 ADAPTOR, AC (AC-330) (85V:UK)
⚠ 1-465-723-11 ADAPTOR, AC (AC-330) (85V:AEP)
1-528-179-11 BATTERY, STORAGE, NI-CD (89V)
1-528-358-11 ADAPTOR, CHARGE (BCA-33) (89V)
3-351-508-01 TUBE, PROTECTION
* 3-367-005-01 CUSHION (UPPER) (82V:US/85V:US)
* 3-367-006-01 CUSHION (LOWER) (82V:US/85V:US)
* 3-368-824-01 CUSHION (UPPER) (86V)
* 3-368-825-01 CUSHION (LOWER) (86V)
* 3-367-010-01 CUSHION (EXCEPT 82V:US/85V:US/86V)
* 3-367-013-01 CARD BOARD (82V:US)
* 3-367-017-01 CARD BOARD (86V)
* 3-367-026-01 CARD BOARD (85V:US)
* 3-367-021-01 CASE, ACCESSORY (85V:AEP/UK)
* 3-367-028-01 CASE, ACCESSORY (85V:Canadian/89V)
* 3-367-015-01 INDIVIDUAL CARTON (82V:E/EA)
* 3-367-024-01 INDIVIDUAL CARTON (84V)
* 3-367-029-01 INDIVIDUAL CARTON (85V:AEP/UK)
* 3-367-031-01 INDIVIDUAL CARTON (89V)
* 3-369-509-01 INDIVIDUAL CARTON (85V:Canadian)
* 3-369-510-01 INDIVIDUAL CARTON (85V:E/EA)
3-570-631-71 BAG, POLYETHYLENE (82V:E, EA/84V)
3-701-623-00 BAG, POLYETHYLENE (89V)
3-753-316-11 MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (84V/85V:Canadian, AEP, UK)
3-753-316-21 MANUAL, INSTRUCTION (ENGLISH) (US)
3-753-316-41 MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (84V:AEP/85V:AEP)
3-753-316-51 MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (82V:E, EA/85V:E, EA)

| Note: | Note: |
|---|---|
| The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified. | Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié. |

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